DATA SHEET

LS Programmable Logic Controller
Analog Output Module

XGB **XBF-DV04A**
XBF-DC04A
XBF-DC04B

- When using LSIS equipment, thoroughly read this datasheet and associated manuals introduced in this datasheet. Also pay careful attention to safety and handle the module properly.
- Store this datasheet in a safe place so that you can take it out and read it whenever necessary.

Davis Controls
A Breed Above the Rest

Davis Controls Ltd is the authorized distributor of LSIS equipment and control solutions throughtout Canada.

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Thank you for your business and your interest in LSIS solutions.

LS constantly endeavors to improve our products so that information in this datasheet is subject to change without notice.

The date of issue: 2011. 5
10310000685 Ver 3.0

■ Safety Precautions

- Safety Precautions is for using the product safely and correctly in order to prevent the accidents and danger, so please go by them.
- The precautions explained here only apply to this module. For safety precautions on the PLC system, refer to User's manual.
- The precautions are divided into 2 sections, 'Warning' and 'Caution'. Each of the meanings is represented as follows.

⚠ Warning If you violate instructions, it can cause death, fatal injury or a considerable loss of property

⚠ Caution If you violate instructions, it can cause a slight injury or a slight loss of products

- The symbols which are indicated in the PLC and User's Manual mean as follows.
  ⚠ This symbol means paying attention because of danger of injury, fire, or malfunction
- This symbol means paying attention because of danger of electric shock.
  ⚡ Store this datasheet in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user

■ Handling Precautions

- Don't drop or make impact.
- Don't detach PCB from case. It may cause problem.
- When wiring, let no foreign material go into the module. If it goes into the module, remove it.
- Don't detach the module from slot while power is on

⚠ Warning

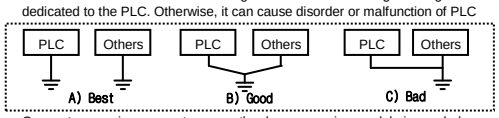
- **Do not contact the terminals while the power is applied.**
  Risk of electric shock and malfunction.
- **Protect the product from being gone into by foreign metallic matter.**
  Risk of fire, electric shock and malfunction.
- **Risk of fire, electric shock and malfunction.**
  Risk of injury and fire by explosion and ignition.

⚠ Caution

- **Be sure to check the rated voltage and terminal arrangement for the module before wiring work.**
  Risk of electric shock, fire and malfunction.
- **Tighten the screw of terminal block with the specified torque range.**
  If the terminal screw is loose, it can cause fire and electric shock.
- **Use the PLC in an environment that meets the general specifications contained in this datasheet.**
  Risk of electrical shock, fire, erroneous operation and deterioration of the PLC.
- **Be sure that external load does not exceed the rating of output module.**
  Risk of fire and erroneous operation.
- **Do not use the PLC in the environment of direct vibration**
  Risk of electrical shock, fire and erroneous operation.
- **Do not disassemble, repair or modify the PLC.**
  Risk of electrical shock, fire and erroneous operation
- **When disposing of PLC and battery, treat it as industrial waste.**
  Risk of poisonous pollution or explosion.

■ Precautions for use

- Do not Install other places except PLC controlled place.
- Make sure that the FG terminal is grounded with class 3 grounding which is dedicated to the PLC. Otherwise, it can cause disorder or malfunction of PLC



- Connect expansion connector correctly when expansion module is needed.
- Do not detach PCB from the case of the module and do not modify the module.
- Turn off power when attaching or detaching module.
- Cellular phone or walkie-talkie should be farther than 30cm from the PLC.
- Input signal and communication line should be farther than 10cm from a high-tension and a power line in order not to be affected by noise and magnetic field.

Related Manual

Read this data sheet carefully prior to any operation, mounting, installation or start-up of the product.

Name	Code
XGB analog	10310000862
XGK XGB Instruction & Programming	10310000509
XGI XGR XEC Instruction & Programming	10310000739
XGB Hardware	10310000893
XGB Hardware (IEC)	10310000981
XG5000	10310000511

Revision History

Date	Version	Updated Information
2006. 11	V1.0	First Edition
2009.05	V2.0	Error in performance specifications is fixed
2011. 05	V3.0	KOREAN/ENGLISH data sheet integrated CI Changed

Applicable version

For system configuration, the following version is necessary.

Item	Applicable Version
XG5000	V3.6 or above

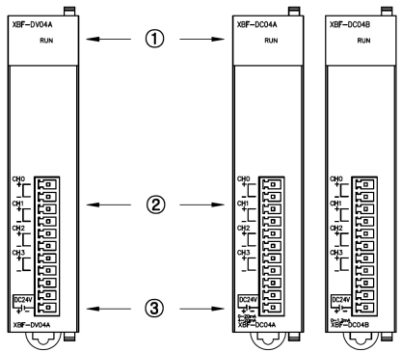
1. General Specifications

No	Item	Specification				Standard
1	Operating temperature	0 ~ 55℃				-
2	Storage temperature	-25 ~ 70℃				-
3	Operating humidity	5 ~ 95%RH, non-condensing				-
4	Storage humidity	5 ~ 95%RH, non-condensing				-
5	Vibration resistance	For discontinuous vibration			-	-
		Frequency	Acceleration	Amplitude	times	IEC61131-2
		10≤f＜57 Hz	-	0.075 mm	10 times in each direction for X, Y, Z	
		57 ≤f≤150 Hz	9.8㎨ (1G)	-		
		For continuous vibration				
		Frequency	Acceleration	Amplitude		
		10≤f＜57 Hz	-	0.035 mm		
		57≤f≤150 Hz	4.9㎨(0.5G)	-		
6	Shocks resistance	• Max. impact acceleration : 147 ㎨ (15G) • Authorized time : 11㎳ • Pulse wave : Sign half-wave pulse (Each 3 times in X,Y,Z directions)				IEC61131-2
7	Noise resistance	Square wave impulse noise	AC: ±1,500V DC: ±900V			LSIS standard
		Electrostatic discharge	Voltage: 4kV (Contact discharge)			IEC61131-2 IEC61000-4-2
		Radiated electromagnetic field noise	80 ~ 1,000 MHz, 10 V/m			IEC61131-2 IEC61000-4-3
		Fast transient /burst noise	Segment	Power supply module	Digital/analog input/output communication interface	IEC61131-2 IEC61000-4-4
			Voltage	2 kV	1 kV	
8	Ambient conditions	No corrosive gas or dust				-
9	Operating height	2000m or less				-
10	Pollution degree	2 or less				-
11	Cooling type	Natural air cooling				-

2. Performance Specifications

Item			Specifications		
			XBF-DV04A	XBF-DC04A	XBF-DC04B
Analog output	Type		Voltage	Current	
	Range		DC 0 ~ 10V (Load resistance: 2kΩ or more)	DC 4 ~ 20㎃ DC 0 ~ 20㎃ (Load resistance: 510Ω or less)	DC 0 ~ 1.2㎃ (Load resistance: 510Ω or less)
Digital input	Type		Signed 12 bit binary data		
	Range	Unsigned value	0 ~ 4000	0 ~ 4000	0 ~ 4000
		Singed Value	-2000 ~ 2000	-2000 ~ 2000	-2000 ~ 2000
		Precise Value	0 ~ 1000	400 ~ 2000 0 ~ 2000	0 ~ 1200
		Percentile Value	0 ~ 1000	0 ~ 1000	0 ~ 1000
Max. resolution			2.5㎷(1/4000)	5㎂(1/4000)	0.3㎂(1/4000)
Accuracy			±0.5% or less		
Max. conversion speed			1㎳/Channel		
Absolute max. output			DC ±15V	DC +25㎃	
Output channel			4 Channel		
Insulation method			Photo-coupler insulation between output terminal and PLC power (no insulation between channels)		
Terminal connected			11 Point terminal		
I/O occupied points			Fixed point assignment: 64 Point		
Consumed current	Internal(DC 5V)		110㎃	110㎃	
	External (DC 21.6~26.4V)		70㎃	120㎃	
Weight			64g	70g	

3. Parts Names and Descriptions

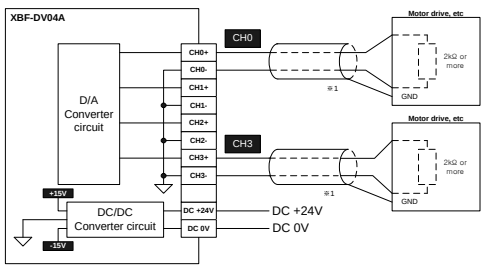


No.	Part Name	Description
①	RUN LED	Displays the operation status On: Operation normal Blink: Error occurs Off: DC 5V disconnected, Module error
②	Analog output terminal (voltage, current)	Analog output(voltage, current) terminal, whose respective channels can be connected with external devices
③	External power input terminal	External power input terminal supplied DC 24V for analog output(voltage, current)

4. Wiring

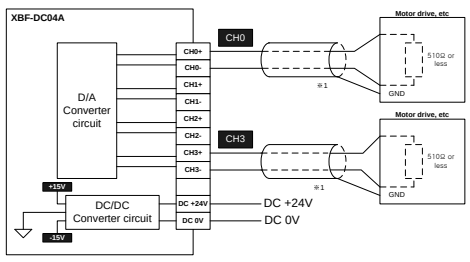
(1) Precautions for wiring
  (a) Don't let AC power line near to analog input module's external input sign line. With an enough distance kept away between, it will be free from surge or inductive noise.
  (b) Cable shall be selected in due consideration of ambient temperature and allowable current, whose size is not less than the max. cable standard of AWG22 (0.3㎟).
  (c) Don't let the cable too close to hot device and material or in direct contact with oil for long, which will cause damage or abnormal operation due to short-circuit.
  (d) Check the polarity when wiring the terminal.
  (e) Wiring with high-voltage line or power line may produce inductive hindrance causing abnormal operation or defect.

(2) Wiring example
  (a) Analog voltage output module



Remarks
*1: Use the cable of 2-core twisted shield.

  (b) Analog current output module



Remarks
*1: Use the cable of 2-core twisted shield.

5. Configuration of Internal Memory

(1) U area of analog output module

(a) XBF-DV04A/XBF-DC04A

Address	Description	Details	Remark
U0x.00	Module ready/ Channel error status	F Bit On(1): Module ready 0~3 Bit On(1): Channel error	Read available
U0x.01	Active channel status	Bit On(1) : Channel used Bit Off(0) : Channel unused	
U0x.02	Output status setting	Bit On(1) : Output Allowed Bit Off(0) : Output disabled	Read/Write available
U0x.03	Ch0 digital input setting	12 Bit binary data	
U0x.04	Ch1 digital input setting		
U0x.05	Ch2 digital input setting		
U0x.06	Ch3 digital input setting		

(b) Bit area

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
U0x.00	Module												CH3	CH2	CH1	CH0
U0x.01													CH3	CH2	CH1	CH0
U0x.02													CH3	CH2	CH1	CH0
U0x.03 ~ U0x.06	12 bit binary data															

(2) Parameter area of analog output module
  (a) XBF-DV04A

Address	Description	Details	Remark
0	Specify channel to use	Bit On (1): Channel used Bit Off (0): Channel unused	Read/Write available
1	Specify voltage output range	Bit (00): 0~10V	
2	Specify input type	Bit (00): 0~4000 Bit (01): -2000~2000 Bit (10): 0~1000 Bit (11): 0~1000	
3	Specify Ch0 output type	0: Outputs the previous value 1: Outputs the min. value of output range 2: Outputs the mid. value of output range 3: Outputs the max. value of output range	
4	Specify Ch1 output type		
5	Specify Ch2 output type		
6	Specify Ch3 output type		
11	Ch0 setting error	Error code area	Read available
12	Ch1 setting error		
13	Ch2 setting error		
14	Ch3 setting error		

  (b) XBF-DC04A

Address	Description	Details	Remark
0	Specify channel to use	Bit On (1): Channel used Bit Off (0): Channel unused	Read/Write available
1	Specify current output range	Bit (00): 4~20㎃ Bit (01): 0~20㎃	
2	Specify input type	Bit (00): 0~4000 Bit (01): -2000~2000 Bit (10): 400~2000/0~20000 Bit (11): 0~1000	
3	Specify Ch0 output type	0: Outputs the previous value 1: Outputs the min. value of output range 2: Outputs the mid. value of output range 3: Outputs the max. value of output range	
4	Specify Ch1 output type		
5	Specify Ch2 output type		
6	Specify Ch3 output type		
11	Ch0 setting error	Error code area	Read available
12	Ch1 setting error		
13	Ch2 setting error		
14	Ch3 setting error		

  (c) XBF-DC04B

Address	Description	Details	Remark
0	Specify channel to use	Bit On (1): Channel used Bit Off (0): Channel unused	Read/Write available
1	Specify current output range	Bit (00): 0~1.2㎃	
2	Specify input type	Bit (00): 0~4000 Bit (01): -2000~2000 Bit (10): 0~1200 Bit (11): 0~1000	
3	Specify Ch0 output type	0: Outputs the previous value 1: Outputs the min. value of output range 2: Outputs the mid. value of output range 3: Outputs the max. value of output range	
4	Specify Ch1 output type		
5	Specify Ch2 output type		
6	Specify Ch3 output type		
11	Ch0 setting error	Error code area	Read available
12	Ch1 setting error		
13	Ch2 setting error		
14	Ch3 setting error		

  (d) Bit Area

Address	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
0	-	-	-	-	-	-	-	-	-	-	-	-	CH3	CH2	CH1	CH0
1	-	-	-	-	-	-	-	-	CH3		CH2		CH1		CH0	
2	-	-	-	-	-	-	-	-	CH3		CH2		CH1		CH0	

(3) Error code

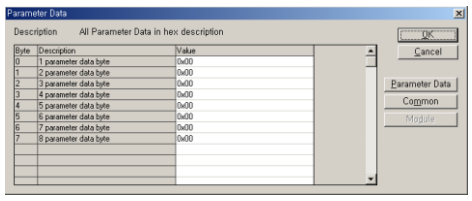
Error code(Dec.)	Description	LED blink cycle
-	Offset, gain adjustment mode	2 Sec.
31#	Error for exceeding parameter range	1 Sec.
41#	Error for exceeding digital input range	

※ # stands for the channel with error found.

6. Extendable Smart I/O adapter

Extendable Smart I/O adapter can be installed up to 4 analog input modules.

(1) Parameter setting of XPL-BSSA (Pnet I/F adapter)
  (a) Parameters setting window



  (b) Parameter setting description

1) XBF-DV04A/XBF-DC04A

	Content	Description
Byte	0	Installation of extandable I/O module in slot 1
	1	Installation of extandable I/O module in slot 2
	2	Installation of extandable I/O module in slot 3
	3	Installation of extandable I/O module in slot 4
	4	Installation of extandable I/O module in slot 5
	5	Installation of extandable I/O module in slot 6
	6	Installation of extandable I/O module in slot 7
	7	Installation of extandable I/O module in slot 8

2) XBF-DV04A

	Setting value	Analog voltage output range	Digital input range
Value	0	0 ~ 10V	0 ~ 4000
	1	0 ~ 10V	0 ~ 1000

3) XBF-DC04A

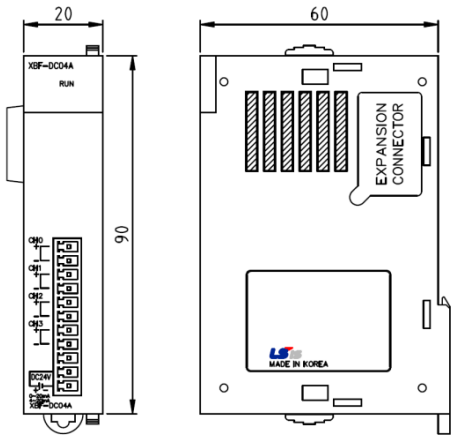
	Setting value	Analog current output range	Digital input range
Value	0	4 ~ 20㎃	0 ~ 4000
	1	0 ~ 20㎃	0 ~ 4000
	2	4 ~ 20㎃	0 ~ 1000
	3	0 ~ 20㎃	0 ~ 1000

Remarks
1) If do not set parameter value, operates on initial value(0)
2) Setting value inputs in analog output respectively, input range is 0~1, 0~3.
3) Parameter value is maintained in connecting communication. At disconnecting communication, parameter value is same as initial value when power is changed Off to On status.

(3) Parameter setting of XDL-BSSA (Dnet I/F adapter)
Analog output range and digital input range can not chage. That is, Analog volatge output range(Analog current output range) is fixed 0~10V(4~20㎃) and digital input range is fixed 0~4000

7. Dimension (㎜)

Dimension of XBF-DV04A, XBF-DC04A, XBF-DC04B is same



8. Warranty

(1) Warranty period
LSIS provides an 18-month-warranty from the date of the production.

(2) Warranty conditions
For troubles within the warranty period, LSIS will replace the entire PLC or repair the troubled parts free of charge except the following cases.
  (a) The troubles caused by improper condition, environment or treatment except the instructions of LSIS.
  (b) The troubles caused by external devices.
  (c) The troubles caused by remodeling or repairing based on the user's own discretion.
  (d) The troubles caused by improper usage of the product.
  (e) The troubles caused by the reason which exceeded the expectation from science and technology level when LSIS manufactured the product.
  (f) The troubles caused by natural disaster.

(3) This warranty is limited to the PLC itself only. It is not valid for the whole system which the PLC is attached to.